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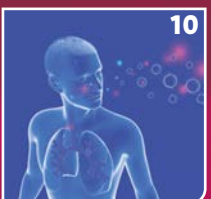
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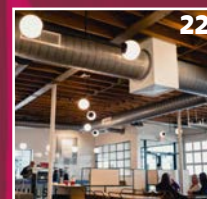
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A look back on what was a big year for the building services sector



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Overcoming the air management challenges created from exposed ceilings



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WELCOME TO THE DECEMBER ISSUE OF MODERN BUILDING SERVICES

As we round up 2023 and look forward to 2024, I'm reflecting on some of the most memorable parts of the year for me. It's got to be how many great industry folks I've been able to meet up with face-to-face. Apart from great opportunities visiting some innovative projects, factory tours to view brand new products and a plethora of forward-thinking training centres, I'd say the networking events also stand out as fond memories – it's wonderful to see how this industry comes together with sharing knowledge and offering support to each other.

MBS are very proud to be strong supporters of many of the most notable events within the industry. The CSA (Commissioning Specialists Association) awards dinner, BESA (Building Engineering Specialists Association) annual conference and awards dinner, The National ACR & Heat Pump Awards, a superb event held in Manchester every year and of course, a first for 2023, the Installer Show.

Training is always at the forefront of my mind as I approach each issue. It's very encouraging to see the increased level of investment within existing/new training centres and uptake of apprentices/trainees throughout the sector.

In this issue BESA share their view on how 2023 was for the building services sector. With an unprecedented surge in legislation and commercial business challenges, there are still reasons to be optimistic about 2024 – turn to page 26 for further input.

We are also focusing on fire safety. Paul Downing, a member of the DW 145 drafting panel explains the requirements and information considered beneficial for building and facility managers and those responsible for maintenance of fire dampers – pages 10 & 11 provides full detail.

Andrew Steel, Managing Director of Airmec Essential Services details the planning of a practical response to the fire damper installation warning on page 12.

I do hope you enjoy this issue and would now like to wish you all a Merry Christmas and hope you have a wonderful time, whatever your plans, over the festive period. I look forward to hearing from you all again in the New Year.

Juliet Loiseau

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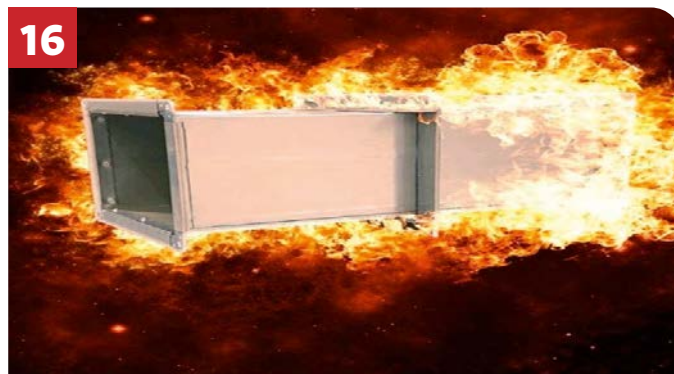


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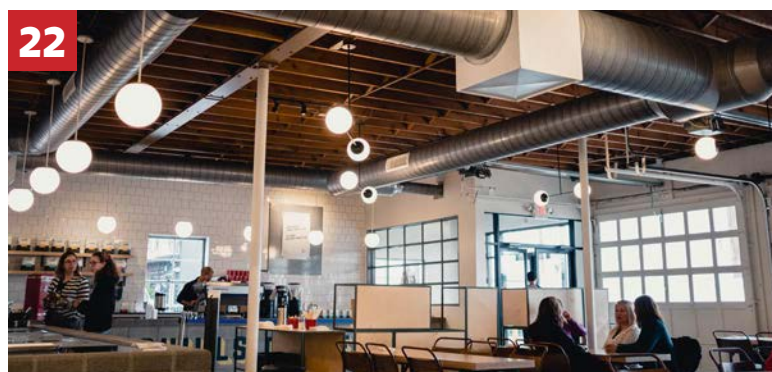
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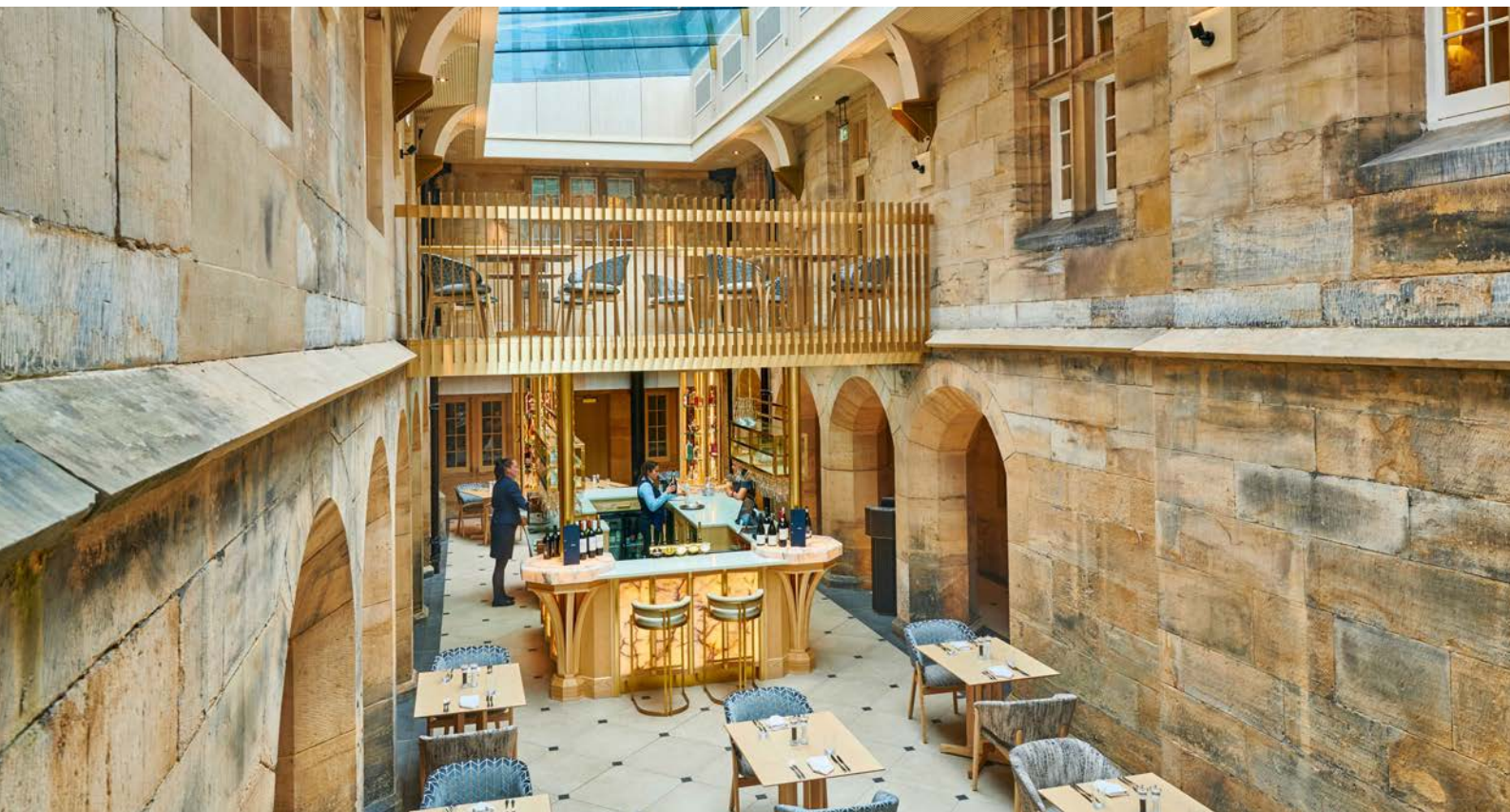
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Ventilators make the grade at historic hall

Natural ventilation solutions manufacturer Passivent has helped breathe new life into the Grade II listed Matfen Hall in Northumberland following an extensive refurbishment programme designed by Doonan Architects.

The gothic hall dates back to 1832 and is used as a hotel and wedding venue. Passivent worked closely with specialist building environment and services engineers Skelly & Couch to develop a natural ventilation strategy for the hall's newly-covered external courtyards. Passivent's Aircool wall ventilators have been used beneath the rooflight to maintain a fresh air supply to the newly-created enclosed area.

General Manager at Matfen Hall, Nathan White, said the refurbishment not only enhances the natural beauty of the hotel but provides much more flexibility for events taking place all year round.

"The covered courtyard has become a real focal point and both the rooflight and the natural ventilation system that are now in place will ensure this stunning outdoor space can be enjoyed to the full for many more years to come," he said.

In total, 10 wall ventilators were installed by Passivent's client, J P Westhall, in the lower courtyard, with seven in the upper courtyard. Passivent also supplied a two-zone iC8000 intelligent controller which monitors the internal and external temperature and carbon dioxide level to allow the facilities team to control the natural ventilation system.

Skelly & Couch worked with Passivent very early in the design stage to access the relevant technical product information and calculate the required free area. This information was then passed back to Passivent so the Aircool wall ventilator's aperture could be sized accordingly.

Skelly & Couch Associate Rosie Jones said: "On such a complex restoration project as this, it was essential that we not only identified the right product but found the right supply chain partner. The Passivent team was extremely efficient and provided us with all the product information we needed in a range of formats so we could advance the technical design of the ventilation strategy effectively."

www.passivent.com

Heat pump project earns two awards

A project linking ground source heat pumps to shared ground borehole arrays, which is a first in the UK, has earned two new accolades for the company that developed it.

Truro-based Kensa Utilities, a ground source heat pump infrastructure asset company, clinched two awards for its Heat the Streets project, which was part funded by the European Regional Development Fund (ERDF).

At the H&V News Awards, the company received the Heat Pump Project of the Year accolade alongside Coastline Housing.

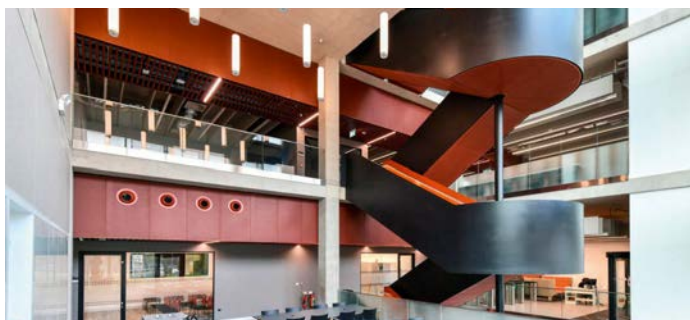
Judges said: "Kensa developed a technical and commercial model that makes budgeting

a cheap and simple solution for occupiers and owners alike," adding: "The lessons learnt from this project will act as a benchmark for future schemes across UK."

Kensa Utilities also secured the Best Home Energy Project title at the Fully Charged Awards in Amsterdam.

Earlier this year, the Heat the Streets project won the Lighthouse Heat Pump Award at the European Heat Pump Association's 2023 Heat Pump Awards, as well as Green Heat Project of the Year at the BusinessGreen Awards.





Acoustic solutions suite, with easy access to services, at University of Birmingham

A suite of ceiling and wall acoustic solutions have been specified for The University of Birmingham's new landmark Molecular Sciences building, which will provide a hub for research and academic work.

Designed for a variety of different users, the acoustic performance of the building has been enhanced through the use of 11 different ceiling and wall systems provided by manufacturer OWA UK.

A demountable hook-on metal ceiling system, specified with a 55% open area, was used in the laboratories, combined with black acoustic fleece and class A pads in some areas apart from lab spaces where a specific ventilation strategy was needed.

In the offices and study rooms, demountable metal ceiling rafts were installed to mask the major M&E services whilst enabling easy access for servicing and repair. The metal rafts were specified in eight different rectangular sizes and irregular trapezoidal shaped versions were installed in the lift lobbies. The rafts were fitted with class A pads to maximise acoustic absorption, with these areas also benefitting from acoustic wall panels.

In the main communal areas of the building, various ceiling systems were installed to control the acoustic reverberation, hide M&E installations, and improve design aesthetics, including a tubular aluminium baffle system, regularly-spaced tubes fitted with a full-length, integrated, LED light and bespoke perforated metal bulkhead panels. The corridor ceiling system uses a simple wall trim to support the panels instead of an overhead grid. The system is quicker to install and allows easier access to pipework and essential services which run through the ceiling void.

For the central staircase leading to an upper atrium area, acoustic ceiling solutions include bespoke rectangular panels beneath the stair runs and segmented panels beneath the semi-circular half landings and in the upper atrium, a clip-in wall panel system was specified to fit around the windows and grilles.

www.owa-ceilings.co.uk

Manufacturer helps equip skills centre

Ideal Heating has helped to equip a new £500,000 green energy centre in Merseyside which is seeking to attract fresh talent into the heating industry.

The Green Energy Skills Centre, at St Helens College, will enable heating engineers to learn the skills needed to install, commission and service air source heat pumps.

It will also provide a showpiece learning environment for students at the college, supporting a broader focus on green skills and energy.

As an Employer Partner, Ideal Heating has equipped the facility with a range of its products, including its Logic Air heat pump and hot water cylinder, helping installers gain experience and confidence at working with these heating solutions.

Free evaluation service for HVAC motors identifies untapped potential for energy savings and carbon reduction



With energy prices continuing to remain volatile, a free service from ABB can help to identify the easiest opportunities to reduce outgoings, as ABB's Carl Turbitt, HVAC Drives UK Sales Manager, explains.

The buildings sector is thought to account for over a third of all

global energy consumption and emissions. HVAC systems are generally responsible for a significant proportion of total building energy consumption, with typical arrangements contributing up to 40 percent. Each system is typically comprised of a variety of applications which are driven by electric motors. These can include air handling units, compressors, supply/extract fans, condenser fans, primary and secondary pump sets, chilled and hot water pumps, and cooling towers. Each one represents an opportunity to potentially save energy and reduce carbon emissions.

Against a backdrop of volatile energy prices in the short term, and the ongoing drive to improve sustainability in the longer term, the building sector is increasingly looking to reduce its energy usage and costs. A variable speed drive (VSD) is a device which controls electric motors electronically to vary their speed according to demand. This means that the motor only draws the minimum amount of energy that it needs for a required output. Without a drive, the motor will run at full power, all the time, potentially wasting vast amounts of energy.

Many of the motors in a typical HVAC system today are run without any form of electronic speed control. The precision control offered by a drive can reduce wasted energy almost instantly, and for some applications can reduce energy usage by 50 percent or more.

Without an intimate knowledge of the inner workings of a system, it can be difficult to know which applications could benefit the most from variable speed control. ABB's free Energy Snapshot service aims to help HVAC system operators to identify the motor-driven applications which are the most promising candidates for energy saving.

The service involves an engineer from ABB or an approved ABB Value Provider carrying out an in-person visit over the course of half a day. The engineer will identify the motor-driven applications that offer the greatest opportunity to cut energy use in the shortest possible time, using the data gathered to produce a bespoke report recommending appropriate solutions for your facility.

With electricity prices continuing to spiral, the need to reduce energy usage and costs has never been greater. Payback times that used to be measured in years are now down to a matter of months, with the drive continuing to save energy and money thereafter. ABB's Energy Snapshot is your shortcut to savings – and there's never been a better time to try it out.



To register your interest in the Energy Snapshot service, visit: https://campaign.abb.com/EnergySnapshot_Web, or contact Carl Turbitt directly at carl.turbitt@gb.abb.com, on 01925 741111, or find him on LinkedIn.

PEOPLE

Seasoned Sales Manager join's Clivet's Residential Team

Chris Bullen has joined Clivet as Sales Manager for the Residential Team, which offers a complete range of chiller, heat pump, packaged, mono and multi split, VRF solutions

Chris has previously worked for Jaga UK and Panasonic.

He said: "I am a seasoned salesman, selling heating equipment including boilers, radiators, fan convectors and trench heating and I know that renewables is the future."

"I am enjoying this opportunity along with the team talking about all things Clivet and love the huge product range they bring to the market, including domestic and commercial heat pumps, energy storage systems, MVHR air purifiers, home automation systems, fan coil units, air quality sensors and more."

"I chose Clivet as they are a forward-thinking company, always looking to the future."

www.clivetgroup.co.uk



Spirotech appoints new UK Technical Advisor

Michael Pitt has taken on the role of UK Technical Advisor for system water treatment solutions manufacturer Spirotech.

He has more than 20 years' experience in the heating and plumbing industry, having specialised in pressurisation, controls, engineering components and applications, as well as fault finding across entire systems. Prior to joining Spirotech, Michael was the Technical Manager at QuickPump Services, helping to design and maintain commercial pump and plant systems.

Michael will host the company's new training sessions for domestic and commercial heating engineers at its new facility in Birmingham. Alongside this, he will provide technical support for customers across the UK and Europe. This includes conducting site visits to investigate, advise and rectify issues they may be experiencing with their systems and equipment.

UK Business Director, Rob Jacques, said: "We are excited to welcome Michael to the team. He brings with him many years of experience within the industry, which will be invaluable for heating engineers attending our new training sessions to learn more about water treatment and our range of solutions."

www.spirotech.co.uk



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Trio promoted to Directors

Building services consultancy CPW has promoted three team members to Directors.

The trio includes Hazel Andrews, part of the sustainability team, Jim Buckley, from the public health team, and Jon Willmott, who heads up the acoustics team.

Since joining CPW in 2012, Hazel has helped to establish the firm's sustainability team, guiding clients through accreditations and reporting systems to create successful energy strategies that aim for a fabric-first approach.

Hazel said: "I joined when the department had just formed and it has been a pleasure to grow our team from four to 12 people as well as greatly expand our expertise and offering."

Jim joined the firm more than seven years ago, growing the public health team and its services. He said: "We have some really exciting plans in the pipeline for the team, including our own research and development commitment to really focus on innovative and sustainable engineering within the sector."

Jon established the acoustics team following his arrival two years ago. "The team has grown in size since its formation, and we have been incredibly well supported in meeting the growing demand across multiple sectors for acoustic input. This promotion is a fantastic way to round off the year and I'm proud to be in great company with Hazel and Jim."

Director at CPW, Andy Hill, said: "We are so pleased for Hazel, Jim, and Jon as their promotions to director not only celebrate their fantastic contributions to the business and a milestone in their careers, but also mark a really exciting moment of growth for CPW."

"We now have nine specialist teams, including sustainability, public health, acoustics, innovations, vertical transport, and more, highlighting our strengths as a multi-disciplinary sustainable engineering consultancy. Hazel, Jim, and Jon have been a key part of this success, so I wish them the best of luck in these new roles and look forward to seeing what they do next."

Established in 1978, CPW has more than 300 staff based across 13 offices located across the UK, Poland, and India. The firm – which works across a wide range of sectors including healthcare, residential, education, and more – specialises in designing and integrating a full range of sustainable energy solutions into existing and new buildings.

www.cpw.com

**Commercial Director appointed at A-Gas**

John Phipps has been appointed as the new A-Gas Commercial Director for the UK. John is a qualified engineer and an IMechE Chartered Engineer with a senior management background in the chemical processing, oil and gas, automotive and aerospace industries. He was recently awarded an executive MBA in sustainability and energy transition with distinction.

John said: "I am delighted to be taking on this position at A-Gas. My main goal is to drive the business forward as we continue to deliver on our purpose to protect and enhance the environment by managing effectively the lifecycle of refrigerants to build a sustainable future."

www.agas.com

New MD for heat pump manufacturer

NIBE Energy Systems has appointed Paul Smith as Managing Director. Paul brings with him a wealth of experience in the UK heating market.

Paul will collaborate with various stakeholders involved in the deployment of heat pumps, including house builders, installers and consumers transitioning from conventional boilers to heat pumps.

He said: "I am proud to have joined NIBE at this pivotal period in the UK's transition to low-carbon technologies. As a heat pump manufacturer, we take immense pride in our product line, and customer service."

www.nibe.eu





2023 was a big year for the building services sector, with an unprecedented surge in legislation and commercial business challenges, but BESA President **Claire Curran** believes there are reasons to be optimistic about 2024.



The IAQ Guide to Good Practice aims to provide clearer technical guidance.

'2023 was tough but the industry is resilient'



The past year has been busy and challenging for members of the Building Engineering Services Association (BESA) and the wider industry. Showing resilience in the face of difficult trading conditions and a blizzard of new regulation was key. Making better use of digital

processes and tools will be vital for our collective future as we seek to be more efficient and productive.

The Building Safety Act certainly picked up pace in 2023 and is now in full force, with the office of the Building Safety Regulator (BSR) ramping up the pressure on the industry to comply.

This new office, which began work in April and is part of the Health & Safety Executive (HSE), continues to remind everyone that the new safety regime will (in time) apply to ALL buildings and includes additional requirements for Higher-Risk Buildings (HRBs) "from shed to Shard".

Dame Judith Hackitt, who is widely regarded as the creator of the legislation as it emerged from her report into the Grenfell Tower tragedy, has also been urging the industry "Lead, don't lag". In other words, don't wait for the

Regulator to tell you what to do, just get on with making buildings safer and better.

Neil Hope-Collins from the Office of the Building Safety Regulator told the BESA Annual Conference in October that the principal contractor had the ultimate responsibility for making sure buildings were planned, managed, and delivered in accordance with the Building Regulations, but said sub-contractors could "push back".

"If they don't give you the time and the resources [to get things right] that's on them, as long as you told them, of course," he said.

Stringent planning process

The planning application process will be more stringent and more detailed design information will be required at an earlier stage. However, Neil said this was designed to reduce problems later in the project by

front-loading the investment of time and money to ultimately make projects cheaper to deliver.

While there is a legal obligation on clients to ensure all works covered by the Building Regulations are properly planned, managed, and monitored, he also pointed out that contractors are required to refuse to start work until they are satisfied the client is aware of its own duties. Building services firms should feel empowered to call out poor practices and measures will be in place to help them do that, he stressed.

BESA staff have been tracking developments since the start and working through the detail to pick out what is of direct relevance to its members. We are also making sure our products and services are aligned to help members achieve compliance. You can visit the BESA Building Safety Act hub for more information.

Many of BESA's services can help members cope with the new building safety regime, including our technical and legal and commercial departments, the BESA Academy, SKILLcard and several of our competence and compliance schemes, as well as the continually-updated SFG20, which keeps building maintainers on top of the latest legislative requirements.

This is not just cleaning...

One area of building safety which witnessed significant progress in 2023 and is set to accelerate

even faster in 2024 is cleaning and maintenance of kitchen extract ventilation systems.

BESA's newly rebranded certification scheme BESA Vent Hygiene Register (VHR) reported a 78% increase in the number of works notified to the VHR digital database last year with the annual total passing 22,000 for the first time. The dramatic increase was attributed to more clients, insurers and fire officers recognising the importance of these systems to the fire integrity of buildings.

There is at least one serious fire in a UK commercial kitchen every

day and owners are becoming increasingly aware that by improving the maintenance of their grease extraction systems, ventilation, and ductwork, they can minimise the risk of a fire spreading. As a result, thousands more systems are now being cleaned in compliance with the industry's TR19® **'Grease Specification: Fire risk Management of Grease Accumulation in Kitchen Extraction Systems'**.

Formerly known as the BESCA Ventilation Hygiene Elite scheme, VHR was rebranded to reflect the growing profile of the profession

and to help it prepare for formal government regulation and as part of BESA's campaign to promote ventilation hygiene as a key element of the wider building safety agenda.

VHR is intended to become the ventilation hygiene equivalent of the mandatory Gas Safe Register, which transformed the safety of gas installation work in the UK. It is recognised by the insurance fire risk body RISCAuthority, and by the London Fire Brigade which recently updated its guidance for catering premises to include new measures from TR19® Grease. →



There is at least one serious fire in a UK commercial kitchen every day, and owners are becoming increasingly aware that by improving the maintenance of their grease extraction systems, ventilation, and ductwork, they can minimise the risk of a fire spreading.

Proving safety competence

The new SKILLcards has been produced for key safety professions including thousands of fire sprinkler, local exhaust ventilation (LEV) and commissioning professionals by BESA's Engineering Services SKILLcard.

SKILLcard worked closely with the British Automatic Fire Sprinkler Association (BAFSA), the Institute of LEV Engineers (ILEVE) and the Commissioning Specialists Association (CSA) to provide updated qualifications to help operatives prove their professional and safety credentials in the face of increased scrutiny of all building work.

The new cards are part of the wider pan-industry Construction Skills Certification Scheme (CSCS) alliance used to provide evidence of professional competence and health & safety qualifications across a whole range of built environment professions. All cards carrying the CSCS logo must now only certify occupations with nationally recognised construction related qualifications such as NVQs or approved equivalents.

SKILLcard said it was delighted to be able to provide the new cards thanks to the positive collaboration between BESA and the other three industry bodies. Head of certification Duncan Sibbald added that it was important for professional accreditations to be continually reviewed and, if necessary, updated to keep pace with the fast-changing building safety environment.

"Clients are more concerned than ever to have third-party verified evidence of an individual's competence and ability to comply with safety legislation. These new cards will provide them with peace of mind and thousands of skilled engineers with the proof of competence they need to carry out their vital life safety work," he said.

Big year for building maintenance

The team behind the industry's maintenance standard SFG20 found that driving down the costs associated with operating and refurbishing buildings became a top priority for facilities managers during 2023 in the face of soaring inflation and across the board cost rises.

Inflation pushed up equipment and material prices, a shortage of skilled people drove up wages, and energy prices had almost doubled at one point. As a result, some owners were tempted to take a

chance with their maintenance programmes and reduce the frequency of key tasks in a bid to make short-term savings.

However, this often meant they got caught up in a damaging and potentially expensive cycle of equipment failures and reduced operating efficiencies which simply drove up their costs again, leaving them at risk of falling foul of the new building safety regime.

SFG20 Product Director Paul Bullard said the problem is exacerbated by the fact that many organisations work on a 100% maintenance approach when budgeting, calculating their costs based on maintaining all of their assets.

"By taking a more targeted approach using digital modelling tools, they can focus their precious resources on those systems that are critical to safety and the efficient operation of the building and redirect funds away from less important assets, some of which could even be run to failure," he said.

"Avoiding over or under-maintaining systems is the key to getting best value for money from a building maintenance programme while remain legally compliant. It is equally important to avoid the temptation to only do the bare minimum to save costs as this can lead to operationally critical assets being undermaintained. That increases the risk of failure, drives up energy costs and reduces their remaining useful life. It's a vicious cycle."

No let-up in push for better indoor air quality

BESA's long-running campaign to turn buildings into 'safe havens' from pollution also received a major boost with the creation of the first British Standard for health and well-being in buildings.

BS40102 (part one) gives recommendations for measuring, monitoring, and reporting indoor environmental quality (IEQ) in all types of non-domestic buildings. It includes an evaluation and rating system for air quality, lighting, thermal comfort, and acoustics.

The evaluation provides building managers with a benchmark score to help them identify areas of below par performance so they can plan improvements and include IEQ measures in any retrofit and renovation work.

BESA IAQ Group chair Nathan Wood said the new standard is

"Clients are more concerned than ever to have third-party verified evidence of an individual's competence and ability to comply with safety legislation. These new cards will provide them with peace of mind and thousands of skilled engineers with the proof of competence they need to carry out their vital life safety work"

an important step forward in the ongoing battle to persuade the government and building owners to focus more attention and investment on the indoor environment.

"Setting IEQ performance benchmarks will make it easier for facilities managers to target problem areas and demonstrate how conditions directly affect health and productivity," he said. "However, we must continue to keep pushing standards upwards as current government targets do not reflect the latest WHO guidance and lack real ambition."

BESA also produced new guidance, 'Mould and Damp Prevention in new and existing Homes'. The Vice Chair of the IAQ Group said it was time to create a "whole new industry" to tackle the health crisis caused by this growing problem.

CEO of ARM Environments, Adam Taylor, pointed out that there is currently no competence requirements for people working in ventilation installation and maintenance.

"Moisture build-up in homes is already at an unprecedented level and the problem is going to get worse because the cost of heating is causing people to reduce ventilation. The mould this creates causes real suffering and is a massive burden on the NHS," he said.

Risk assessments

More risk assessments and air quality monitoring are being carried out. These have highlighted how many buildings are seriously under-ventilated. "We need to create a new profession of specialists focused specifically on ventilation with formal qualifications, agreed standards and best practice," he said.

BESA also urged local authorities, housing associations and other housing providers to make ventilation upgrades a key part of retrofit and refurbishment programmes. With up to £80 million of government funding being made available to social housing tenants to make their homes more energy efficient, the association believes this is also an opportunity to take an 'all round approach' to tackling poor quality housing.

Our work in this area was further enhanced with the launch of a 'basic awareness' training course for IAQ by the Association's online training Academy and based on the IAQ Group's guides – and we continue to support the growing campaign for new clean air legislation, which we hope to see come to fruition in 2024.

This is just a taste of the breadth of activity across our sector in 2023 and serves to illustrate the crucial role played by building engineering services in many parts of our society and economy, which should give us all optimism for the future.



More information is available at

www.theBESA.com

www.sfg20.co.uk

www.venthygieneregister.com

www.skillcard.org.uk

'Building Safety Act will not create two models'

Newly-formed BESA advisory group says new legislation will transform all aspects of project delivery and business management.

The construction industry will not be able to operate a two-track system under new building safety legislation, according to the Building Engineering Services Association (BESA).

The early focus of the Building Safety Act is on higher-risk buildings (HRBs) which are primarily high-rise multi-use and residential, but this does not mean all other work can carry on as before, the association warned.

Following the first meeting of BESA's newly-formed Building Safety Act Advisory Group (BSAAG), members agreed that the requirements of the legislation would transform all aspects of project delivery and business management. While Tier One contractors are leading the process of change, they will expect all members of their project supply chains to adopt new ways of working.

The group's chair Nick Mead said: "This is transformational legislation that will impact everyone working in building services engineering. The Regulator's eye is now firmly fixed on HRBs but that does not mean we can ignore the implications for other projects.

"The Act has already led to fundamental changes to other regulatory standards, including Approved Document B, which applies to all projects, and there are a lot more to come. It is also influencing competency requirements across the board, so this is not something that anyone can avoid whether they work on HRBs or not."

Nick, who is Technical Director of MEICA Systems at Laing O'Rourke, said clients and Tier Ones would expect contractors working in their supply chains to step up to the challenges posed by the Act.

"No construction business could possibly consider trying to operate

two delivery models," he said. "Why would we? These new rules have been put in place to address decades-old safety and quality problems so it is in all our interests to comply and drive much-needed culture change across the whole industry."

The advisory group was established by BESA's new Director of Specialist Knowledge, Rachel Davidson, to agree priorities for the building services contracting sector and help the association create focused guidance to help firms of all sizes adapt to the new requirements.

The association already disseminates news and updates about the Act via its online information hub and plans to considerably enhance that service, with details specifically tailored for building services companies and individual engineers steered by the advisory group.

"It was clear from our first meeting that there is an urgent need to simplify information around the Act," said Rachel. "There is a danger that some firms will be tempted to ignore the legislation unless they can access simple guidance which is directly relevant to them and their roles within project teams.

"The group was also very clear that it wants to see better collaboration across the industry, particularly between trade and professional bodies, so we can ensure the advice and guidance we provide is fit for purpose and up to date."

The Regulator will be paying particular attention to technical and professional competence to ensure work can be completed in compliance with the Building Regulations – and this will mean contractors will have to provide considerably more evidence of both individual and organisational competence than they have previously, Rachel added.

BESA's new Director of Specialist Knowledge, Rachel Davidson



She added that the Regulator had already indicated it expected the industry to "own its responsibilities" by driving improvements in the competency culture. Tier Ones, in particular, will be expected to use their procurement processes to embed culture change in their supply chains.

Contractors of all sizes should also prepare themselves for significant changes to contract terms that reflect the new responsibilities defined by the Act, and the group advised that firms may need to take legal and commercial advice.

Facilities managers will also play a crucial role because of the clear implications for the ongoing safe operation of buildings, which should have already been addressed by the time projects are handed over.

"All of us must get into the mindset that this is about any building not just high-rise," said Nick, who is also a former CIBSE President. "BESA is in a strong position to bring all the relevant information together, and make sure this does not become intimidating for the smaller firms."

Opportunity

Nick is encouraging everyone in the supply chain to look at this as a business opportunity. "If you

can show that you are ready for the changes and are embracing them, you will be in pole position when it comes to contracts being awarded," he said.

BESA has also welcomed the announcement that a group of the largest contractors, developers and housebuilders had pledged to work with the rest of the industry to improve construction product quality in line with the requirements of the Act.

Barratt Developments, Berkeley Homes, Mace Group, Morgan Sindall, Murphy, Persimmon Homes, and Skanska UK all pledged their support for the Code for Construction Product Information (CCPI), which means they must ensure the suppliers and manufacturers they work with agreed quality standards.

The code is designed to ensure that products meet performance claims and are supported by technical competency so that clients, specifiers, and users will only accept CCPI compliant products for their projects.



More information is available at
www.thebesa.com/building-safety-act



Closing the **ventilation skills** gap



Stuart Smith, Commercial Director at indoor climate solutions provider Zehnder Group UK, discusses the urgent need for specialised training in M&E contracting.

The UK boasts some of the best M&E contractors in Europe. For the ventilation industry they are the frontline champions installing, maintaining and servicing air distribution systems to keep buildings of mass occupation healthy and working efficiently.

I therefore ask myself why it is that more than 80% of the customer service calls we receive are about products 'going wrong'. On investigation, are the majority of these a result of poor installation or maintenance? The answer is a complex one and multi-faceted.

While this seems reminiscent of a parent bemoaning how it was 'a

lot simpler in the old days', in this case it's the truth. Ventilation, in its simplest form, was a fan in a box. Nowadays those box fans have evolved to become sophisticated pieces of innovative technology that need specialist knowledge for installing and commissioning. Digital controls, air flow calculations and zoning all need considered approaches in each building to be effective. They can't be fitted by any tradesman.

A poor installation can have serious detrimental effects on a building's fabric, causing condensation issues that can lead to toxic black mould, excessive use of energy that drives up the running costs of a building and, most alarmingly, pose a health risk for the occupants inside through poor indoor air quality. It's well known that this can affect the productivity of a workforce and lead to serious illnesses and respiratory diseases.

Bad airflow through a building can also have a profound effect on

overall occupant wellbeing because of extreme noise levels resulting from pressure through the ducting.

Yet this is happening across the industry and we are seeing all manner of tradesman, from pipework engineers to electricians, trying to install and commission ventilation products to save time and budget on builds (new and refit).

This is happening because there are not enough specialist M&E contractors who are ventilation qualified and can do the job properly, meaning quotes aren't competitive enough and the result is shortcuts being taken.

Addressing the skills gap

When we talk about a skills gap within an industry, we immediately think it's down to the lack of talent coming through from colleges and schools. While this is a big part of it, the skills gap is also evident generationally when it comes to ventilation.

At the apprenticeship level, becoming a ventilation engineer

is currently not an option for those coming through colleges. There are no recognised courses for ventilation design and installation like there is for air conditioning (F-gas specialist) or boiler installation (Corgie).

You could argue that these systems are potentially dangerous and could cause serious harm if not installed correctly, which is why there is a greater focus on qualifications in these sectors. Yet the recent news agenda shows us, through Covid-19 and the recent cases of health issues and death resulting from mould and air pollution, that lack of good ventilation in both homes and working buildings can be fatal.

Building industry associations are pushing for a national competency course to address this. A recognised qualification would equip apprentices with a well-rounded knowledge set and proficiency that they can develop and pass down to others as they mature. But it is slow progress to get

this rolled out and is likely to only be focused on residential installation. It needs to encompass commercial too, allowing that skill set to really flourish.

This lack of training doesn't just impact at the entry level. Without a national roll-out of ongoing development courses, working contractors risk falling behind as ventilation technology evolves and we gain a greater understanding of how ventilation impacts a building.

Two decades ago there was a unique skill set in the ventilation industry where installers had a better understanding of ventilation methods, what is good and what is bad, and designers understood the equations required for effective ventilation from each fan specified to a build.

While technology has changed and evolved to a more sophisticated level of output and digitisation, these core principles remain relevant and as important at every installation, yet they have been forgotten.

With building regulations now putting more emphasis on ventilation performance and energy efficiency, a comprehensive understanding of ventilation practices has never been more important to provide a quantitative basis for designing, analysing and optimising ventilation systems. This contributes to efficient and effective operation in various industrial, commercial, and residential applications.

Without this knowledge and a good understanding of the building regulations for ventilation, the industry is falling short, with unqualified engineers being made responsible for installing these complex systems.

Preparedness for the future

In the absence of a nationally-recognised college qualification in ventilation design and installation, it's falling to the private sector to take action.

Training can be led by manufacturer investments, in collaboration with educational institutions and industry associations. By developing specialised programmes in ventilation technology, HVAC and related fields within engineering and construction qualifications, young talent can be offered a taste of M&E expertise and champion action through experience.

We can also take advantage of progressive technological interests in young apprentices, highlighting

the industry's commitment to innovation and technology adoption. With ventilation systems now incorporating smart technologies and sustainable practices, it makes the field appealing to those interested in cutting-edge solutions and digitisation.

The question, however, is how the whole industry can be better trained and bought up-to-date with product technologies, ventilation effectiveness and design. Qualifications on how to best install a ventilation system is only a part of the overall puzzle. We also need to address post-installation service and fan maintenance to protect the calibre and reputation of products and brands, as well as provide the best levels of after-care.

Ultimately, correct installations and ongoing maintenance from a reliable and competent M&E contractor will prolong the life of a ventilation system, providing better energy efficiency on our road to net zero, protecting building health and wellbeing for the occupants inside. We need to work together to make this happen quickly before the existing frontline becomes our last line of defence.



More information can be found at www.zehnder.co.uk





The key role of the passive protectors



Paul Downing, a member of the DW 145 drafting panel, explains the requirements and information considered beneficial for building facility managers and those responsible for maintenance.

Following amendments and rebranding, the BESA DW145 is expected to be published as a building services specification by the Building Engineering Services Association (BESA) and launched in 2024. It will cover design, specification and selection of fire dampers to include installation, inspection and testing.

Fire dampers are installed into the ductwork of ventilation systems to help delay the spread of smoke and fire to allow people sufficient time to safely evacuate a building in the event of a fire.

If a fire was to break out in a building with no fire dampers installed, it can quickly and easily pass through duct systems, spreading rapidly throughout the premises, and infiltrating fire-resistant walls and floors into escape routes.

Fire dampers are designed to delay this by closing shut when a fire occurs. This helps to hold back the fire, reduce it from spreading into escape routes and causing greater damage to property and the building itself. Most importantly, they protect the lives of those inside by preserving the integrity of fire escape routes.

As with any safety apparatus, fire dampers need to be regularly inspected, tested on an annual basis as a minimum and maintained to ensure that when the time comes, they will work effectively for the purpose of passive fire protection.

Compartmentation

Commonly called “penetration seals”, compartmentation is required where ventilation passes through compartment boundaries.

Building regulations and guidance such as Approved Document B describe the control of fire by compartmentation that keeps the fire in the space of origin and preventing it from spreading to other areas. This is generally achieved using passive fire protection principles such as fire

dampers, fire stopping materials and penetration seals.

When ductwork penetrates through a compartment boundary (fire resisting wall or floor), the compartmentation is broken, therefore it must be re-instated. This requires very careful consideration of the information provided by the ductwork provider and fire damper manufacturer. Dampers and associated penetration seals must be installed to match the same level of protection as the compartment boundary provided.

Fire Damper Activation

Fire dampers are fitted into ventilation ductwork in areas where they pass through fire-rated walls and floors which are fire compartment barriers. They work by springing closed (like a roller shutter) to stop the flow of fire or smoke and can be activated in two ways:

1. When a given temperature is reached, a ‘fusible link’ which holds the shutters apart will melt and trigger them to slam shut.
2. Electronic dampers are activated

by smoke and fire detectors (sensors) which are linked to a trigger mechanism that closes the shutters.

Legislative compliance and standards

Some of the following regulations and standard guidance include, but are not limited to, the following:

1. The Regulatory Reform (fire safety) Order (RRO) 2005

This came into effect in October 2006 and had a major impact on responsibility for fire safety. The RRFSSO changed the responsibility for a facility’s fire safety system to the organisation’s “responsible person”.

Typically, the responsible person is the employer, or the owner of the facility. Fire safety systems must be kept in order and include all active and passive fire protection systems.

Included in the list of items in the passive fire protection systems are the maintenance of the fire and smoke dampers.

In general terms, the RRFSSO reflects the duties and approach contained within the Management of Health and Safety at Work

Regulations 1999 and employee's duties under the Health at Work Act 1974 and the Building Safety Act 2022.

2. Building Regulations 2022 - Fire Safety Approved Document Volume 2: Buildings other than dwellings. Part B: Fire Safety:

"The damper assembly shall have a fire integrity classification equal to the fire barrier it penetrates."

Also referred to simply as 'Part B', this government document is designed to give guidance on fire precautions relating to the wider Building Regulations in England. Collectively these must be adhered to keep people and premises safe – including occupants or residents, visitors, and fire-fighting services as well as those in the vicinity of premises. The document also addresses the internal spread of a fire due to the structure or lining used within a building and safety measures related to this.

3. BS: 9999 Code of Practice for Fire Safety in the Design, Management, and use of Buildings

Any grille or opening through the enclosure for ventilation purposes should be protected by a fire damper. BS 9999 defines a fire damper as a mechanical device that is operated automatically or manually and is designed to prevent the passage of fire which, together with its frame, is capable of meeting for a stated period the fire resistance the criterion for integrity.

"All fire dampers should be tested by a competent person on completion of the installation and at least annually, they should be repaired or replaced immediately if found to be faulty."

"Spring operated Fire Dampers should be tested annually, and Fire Dampers situated in dust laden or similar atmospheres should be tested much more frequently, at periods suited to the degree of pollution."

4. BS: 7974 - Application of fire safety engineering principles to the design of buildings

A framework for an engineering approach for the fire safety of buildings, giving recommendations and guidance on applying scientific and engineering principles for the protection of people, property, and the environment from fire. It applies to the design of new buildings and the appraisal of existing buildings and primary users include fire safety engineering practitioners.

5. Association for Specialist Fire Protection (ASFP) Grey Book: EN Fire Dampers

EN Fire Dampers As used in ventilation systems to maintain fire compartments and/or to protect means of escape from buildings. Gives guidance on EN fire testing, classification, application, and installation.

6. Association for Specialist Fire Protection (ASFP) Red Book

Fire Stopping Is the definitive guide to the provision of proprietary materials and systems used to provide fire stopping and sealing of penetrations within fire separating elements to comply with building regulations.

7. NHS Estates HTM 03-01 Heating and ventilation of health sector buildings

Part B Operational management and performance verification' calls for all fire dampers to be tested annually.

8. NHS Estates HTM 05-03 Fire Code

Guidance in support of functional provisions (Fire safety in the design of healthcare premises). All structural fire protection and elements of fire compartmentation should be inspected and any remedial action carried out annually.

9. BESA VH001 – Fire and Smoke Damper Maintenance

The key change in the updated VH001 third edition is the requirement for testing to include reporting on where dampers have been incorrectly installed without break-away joints.

10. BESA DW145 – Guidance for the installation of fire and smoke dampers

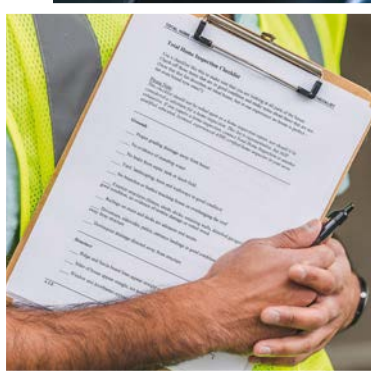
Currently under review, amendment and re-branding, it is envisaged that VH 001 (4th Edition) Fire Damper Maintenance content will also be incorporated into the amendments and re-branding of BESA DW/145 specification.

10. National Occupational Standards (NOS)

Developed by a team of UK industry experts (Employers, trade associations, unions, and other key stakeholders) to capture the relevant competencies for those whose role includes working on fire and smoke control dampers across the UK.

Electronic dampers are activated when sensors detect smoke and fire, linking to a trigger mechanism that closes the shutters.

▼ Fire dampers are fitted into ventilation ductwork in areas where they pass through fire-rated walls and floors.



◀ Typically, the responsible person is the employer or owner of the facility. Fire safety systems must be kept in order and include all active and passive fire protection systems.

The **Tek screw** timebomb



Airmec Essential Services Managing Director **Andrew Steel** details the planning of a practical response to the fire damper installation warning.

Annual inspection of fire dampers is required to meet the requirements of BS999: Code of practice for fire safety in the design, management and use of buildings and where adequate inspection hatches have not already been fitted, building owners and managers have been facing unexpected expenditure which can leave a big hole in the FM budgets.

We are now waking up to another ticking bomb; The use of steel self-drilling (Tek) screws to install fire dampers in the first place.

Let's assume that designers and installers did what was necessary by following manufacturer instructions in good faith. However, the majority of installations we see have ductwork connected to fire dampers using steel self-drilling screws. The installers may have made savings by having a speedier installation, but you are going to have to fund the remediation work.

The issue has been flagged up by the Building Engineering Services Association, which says that maintenance contractors carrying out annual inspections have found that "a huge number

of dampers" had been incorrectly installed, presenting risk that cannot be ignored.

The call to action

It's now necessary to ensure there is an up-to-date survey for fire dampers, and plan remedial works as necessary.

It's work that involves multiple skill sets. It cannot just be tagged on to the routine annual inspection and drop testing. The person who can survey and report on the condition and installation of a fire damper infrastructure is not the same as the technician who will typically undertake the routine inspection, testing and cleaning of dampers.

Their proficiency levels and hourly rates are vastly different. Rather than panicking however, take

the opportunity to scope and price the work properly. Any remediation contract will base estimates on an hourly rate, so it's important that the team your partner fields brings the right combination of skills to the table in the right ratios.

What might the outcome of a survey be? Ideally a clean bill of health. If not, incorrectly-fixed dampers can usually be refitted using required fusible fixings for a fraction of the cost of replacing a damper from scratch. Re-fixing work would be followed by a suitably qualified and registered passive fire protection specialist verifying the correct fire stopping system has been applied and correctly installed. Only then comes the return to routine annual inspection, testing and resetting of the fire damper.





Don't be fooled by the fact that dampers have apparently passed muster before. A damper with the wrong fixing screws could be in good working order and pass annual routine inspection and testing but if it has the wrong fixings, it may well not perform in a fire.

Work with your service contractor to build a matrix of tasks to be carried out and identify the skills needed to do them. All of this should be based on a judgement of the risk attached of the various issues.

The problem

'The current concern surrounds the use of the wrong type of fixings, self-drilling or Tek screws, to fix ventilation ductwork to dampers. As fire damper inspectors and testers, we can attest to having seen enough instances of this to know the issue is a real and live concern, although no-one knows for sure how common it is. So, you need a strategy for checking all your dampers and scheduling remedial work as necessary.

Correctly-installed dampers must be secured by fixings such as aluminium or nylon, that melt in a fire and allow the duct to break away, otherwise a collapsing duct could pull the damper out of place and break the seal between the fire zones.

Why now?

We in the services industry have been successful in boosting the uptake of fire damper testing and inspection across all industries, and that has eventually led to there being a critical mass of feedback on the use of inappropriate fixings. The issue cannot now be ignored and, quite rightly, the industry itself is pushing it to the forefront.

The alarm bell was sounded last year by The BESA (Building Engineering Services Association), and the strength of the warning has successfully precipitated government action from the UK's product regulator, the Office for Product Safety and Standards (OPSS). OPSS says it has contacted some manufacturers, importers or distributors of smoke control dampers asking for documentation which includes, but is not limited to, declarations of performance.

BESA is updating its own guidance which will presumably spell out chapter and verse on how fire dampers should be fitted. The new guidance is expected later this year, but BESA has already issued an Interim technical note on fire damper maintenance to stress the importance of using the correct fixings for dampers.

Be under no illusion: Incorrectly-installed fire dampers may well not perform their function of reducing the spread of smoke in a building during a fire. You need to act now to check on your installation.

The guidance

There are multiple statutes for fire dampers. At the top of the regulatory tree is The Regulatory Reform (Fire Safety Order) which requires that the person responsible for the building (be that the owner or the occupying employer) takes necessary precautions for fire safety in a building.

BS 9999 is the recognised Code of Practice for fire safety in the design, management and use of buildings and it requires that fire and smoke dampers are tested annually. Any dampers found to be faulty must be repaired or replaced on an urgent basis.

At a practical level, it is **BESA DW145 – Guide to good practice for the installation of fire and smoke dampers** and **BESA VH001 – Fire damper maintenance** which are the touchstones. VH001 3rd edition requires confirmation of the presence of breakaway and

flexible joints that will leave the damper in place and maintain fire separation if there is a fire.

Who is responsible?

There are a lot of people involved in fire damper specification and installation but overarching all this is the previously-mentioned Regulatory Reform (Fire Safety Order) which states that it's the responsibility of the person in charge of the building to take necessary precautions.



More information is available at www.airmec.co.uk

What is **the real fire risk** from solar panels?



As more installations are made on commercial buildings, Founder and Managing Director Aztec Solar Energy Ltd, **Richard Williams**, shares his views on safety issues and the need for greater statutory regulation.

Between 2020 and 2021, the UK fire service saw a 12% increase in the number of fire incidents relating to solar panel systems, with a further rise in 2022.

All over the world, the number of incidents reported is increasing.

A series of fires destroyed hundreds of solar panels at Amazon's Fresno warehouse in California in 2020. The company went on to experience five more similar events over the following 14 months. Walmart saw seven fires, attributable to SolarCity (Tesla's solar panel business) acquired in 2016. Walmart had hired SolarCity to install and manage panels on the roofs of more than 240 stores. One store fire resulted in damage estimated at \$1million.

In the UK in April 2022, Bristol's science centre attraction 'We the

Curious', was damaged by fire reported to have started with rooftop solar panels. At the city's largest PV installation, around 60 panels out of 200 were damaged and the attraction closed, not due to reopen until 2024. It is reported that a flock of birds damaged a panel and triggered a fault in the electrical system. There is a 0.01% chance of this happening, according to the Building Research Establishment (BRE) report.

Fighting a PV blaze presents specific challenges. One of the first tasks is to disconnect the building utilities. However, it's not possible to shut PV panels off like a switch. It takes time for them to de-energise. The inverter can hold a charge and pass electricity back to the PV panels. The conduit leading from the PV panels to an inverter remains live with direct current even after the main service panel has been shut off. During a fire this can have a huge impact when every second counts.

Growth in installations

Faced with such reports, we have to ask ourselves whether

these incidents are impacting on confidence and the growth of solar photovoltaic panels.

Last year, primarily as a result of the energy price crisis and a sustainability drive, the solar power industry saw a significant jump in solar PV installations. According to data from the Microgeneration Certification Scheme (MCS), the standards organisation for solar energy and heating, 130,596 solar panels were mounted on UK roof tops in 2022.

This one-year growth was equivalent to the growth experienced in the three years between 2019 to 2021 combined, apart from those years following subsidy changes.

These figures include all solar PV systems with a generating capacity of up to 50 kilowatts and registered with the MCS. Therefore the figure is likely to be even higher, with an increasing number of installations in the UK not registered at all.

It does mean there are more than 1.3 million registered solar power installations across the country; two thirds on the ground and the remainder on residential and commercial roofs, generating at least 15GW of solar power in the UK.

PV solar panels promise cost savings in terms of energy bills and are described as the clean and green electric energy. Seen in many a field and roof top, the growth has been most significant in the domestic market, but the energy landscape is changing fast within commercial and industrial now battery energy storage is becoming more cost effective. In essence, a PV system on industrial and commercial buildings is essentially the same as a domestic installation, except in size and that most are tied into the utility grid.

The PV modules are built from cells and then arranged in strings and arrays, wired together in a series to increase voltage. In a PV array two or more strings are connected in parallel to increase amperage. PV cells produce direct current (DC) power, which needs to be converted into alternating current (AC) power in the inverter.

With this rise in demand, some may be shocked that PV installers are not legally bound to follow the guidelines or obtain accreditations from certifying organisations such as the MCS.

Safety monitoring

So what controls are in place and who is monitoring safety?

The big issue is that anyone can install a solar panel in the UK. Although work must be cleared by the local council and the government 'recommends' use of a registered electrician, it's not a necessity by law.

As with all electrical installations, electrical incidents may happen, which is why all electricians are qualified and must undertake regular competency and on-going refresher training. The risk of a solar panel catching fire is still very low, but it's not zero.

Solar panel fires can be caused by improper installation or maintenance, arc faults and faulty wiring or from extreme weather events, such as hail or lightning, or as suspected in the case in Bristol – birds.

In the USA, one of the biggest issues has been arc faults. Higher voltages can be prone to arcing. It arises as there is DC power on the roof which, if there is leakage on a cable or connector, defaults to earth as it's a constant current. However, improvements in the latest technology manufactured into the newest panels and micro inverters being produced, detect the heat output prior to attaining

an arc. The current output is converted to a safer level that considerably reduces these risks.

It's important to be up to date with these latest improvements in technologies as well as recent safety recommendations and regulations. New solar panels are also more resilient, offering an even greater reduction in fire risks. Understanding these products and their installation comes from experience of working in an evolving sector with experts who can recommend the most appropriate panels and systems for installation.

It's vital to use reputable and registered PV installers and checks need to be carried out regularly. The first step would simply be to ensure those installing your PV and/or battery storage systems are registered with the MCS, and installation conducted in accordance with IET guidance. This will verify their competence and the installer is duty bound to use verified products, so ensuring safety and quality.

Following installation, PV panels can so easily be neglected and left to deteriorate. With those systems come risks. We now need to raise this issue among those who may have installed their systems more than 10 years ago.

Anyone concerned about their PV systems should seek further advice and consider retrofitting a micro inverter AC system or module level optimisation. Look at the maintenance programme and ensure the system has been checked through periodic testing by a professional. All installations should address an ongoing operations and maintenance agreement to avoid costly faults.

Above all, if you suspect any signs of overheating, the first task is to isolate the supply, and call the installer.

The industry is proactively working on solutions to prevent and mitigate fire hazards. As with all technologies that have been installed by qualified engineers and are maintained and managed, solar PV panels will continue to deliver clean, cost-effective power, safely.



More information
is available at
www.aztecsolarenergy.co.uk



The challenge of **over-exposure**



Tim Tanner, Product Technical Manager – Ventilation Technology at TROX UK, discusses how air management challenges with exposed ceilings can be overcome.

Exposed ceilings are proving increasingly popular with today's architects and interior designers, but the cool industrial vibe can prove decidedly uncomfortable for room occupants.

The absence of a ceiling surface creates inevitable challenges in relation to air movement and acoustics, which can lead to unwelcome noise levels, uneven temperatures and draughts.

The problems relate to the way in which air reacts when introduced into the space at ceiling level. In spaces with suspended ceilings, Coanda effect (the tendency of a fluid jet to stay attached to a convex surface) prevents 'dumping' of cold air into the room. A typical air distribution approach would see the supply air "attach" to the ceiling because of low-pressure differential between the jet and the ceiling.

This keeps the cooler and denser supply air higher for longer. As it travels, the jet of air expands and mixes with the warmer room air, reducing the temperature differential and the velocity, so when it hits the wall or a jet travelling from the opposite direction and descends into the occupied zone, it is more comfortable for the room occupant.

Standard ceiling diffusers are only designed to work with an adjacent ceiling surface. If the ceiling system is removed, for an exposed ceiling, almost all standard diffusers will be unable to function correctly. The loss of Coanda effect/ceiling attachment will result in near vertical discharge of cooler air into the space, therefore insufficient time for air to mix.

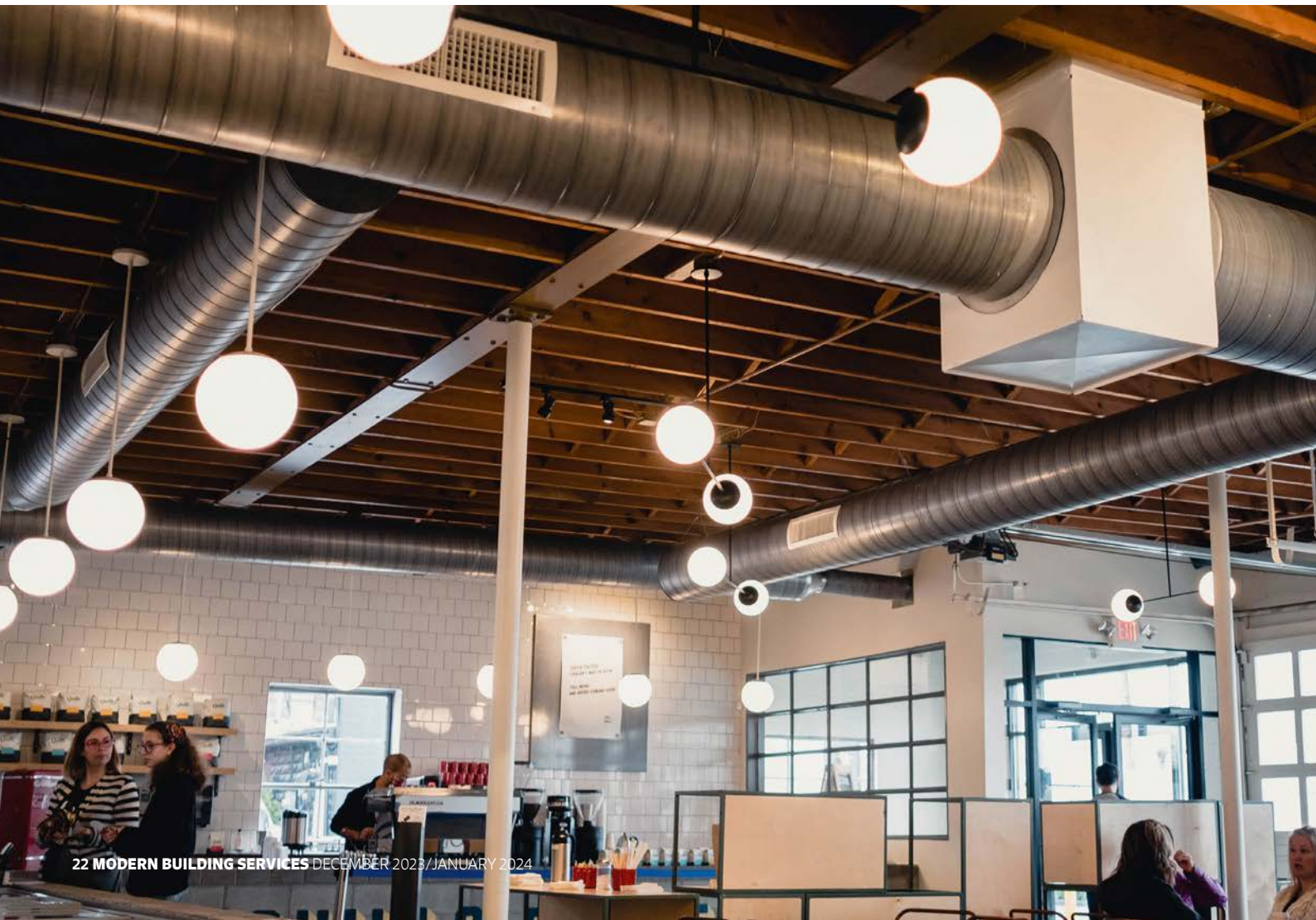
Even with a high discharge velocity and pressure, diffusers may still dump without a ceiling to provide Coanda effect. If the distance from the air discharge to the occupant is not sufficient, the air will not mix, resulting in excessive velocity (high air speed), excessive temperature differential (large difference between room and supply air) and a high risk of draughts.

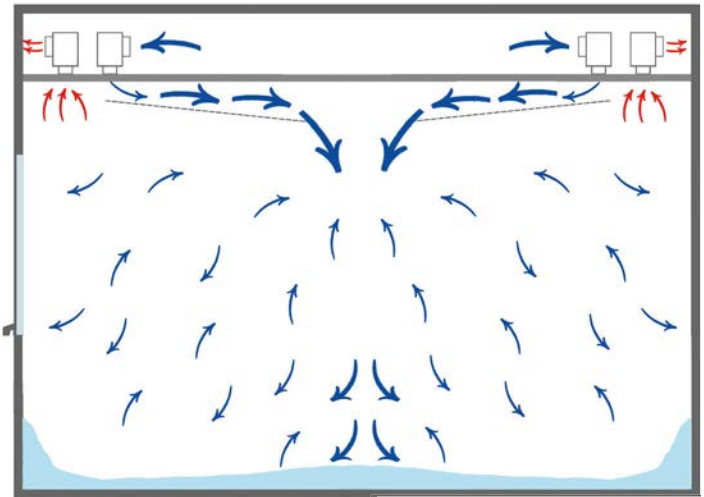
This would make it difficult to achieve the required comfort

conditions. ISO7730 states a with DR of more than 20% is necessary for a CAT B environment.

This need for higher discharge velocities in exposed installations greatly effects the turndown that can be achieved by fan coils and the associated air terminal devices. It is also important to consider the effect of the supply temperature when selecting exposed diffusers where heating is required. Without a ceiling, warm supply air will stratify rather than serving the occupied zone. Overcoming this problem requires low temperature differentials or, preferably, variable geometry diffusers.

The requirement for an exposed diffuser to have a higher discharge velocity has an impact on the possible turndown. When installed within a suspended ceiling, RFD





When a jet of air hits the wall (Left) or a jet travelling from the opposite direction (Right) it descends into the occupied zone.

diffusers can turn down to a discharge velocity of 2.0m/s.

Without a suspended ceiling acting as a Coanda surface, the minimum discharge velocity for a RFD is 3.5m/s. If we take a RFD/250 selected at 15Pa, this will give 74L/s, with a ceiling the diffuser can turndown to 30L/s or 41%. When installed exposed the turndown is restricted to 53L/s or 72%. While, this has clear disadvantages, there is the upside of being able to oversize VAV which can mitigate some of the acoustic issues.

Acoustics

The absence of a suspended ceiling, sub-dividing the services zone from the room occupants, has a significant impact on noise levels. Suspended ceilings are typically constructed from metal tiles incorporating acoustic materials that can absorb sound, minimising noise and reducing the reverberation time within the occupied space.

Without these sound-absorbing materials in the vicinity of building services, ambient noise can be expected to increase. In addition, the hard surfaces of an exposed ceiling accentuate echo effects, amplifying sound generated by room occupants. This, in turn, can cause occupants to speak louder, to be heard over the ambient noise, leading to an escalation of the problem.

To assess the acoustic requirements for a room with exposed services, a direct noise contribution therefore needs to be calculated. This includes assessment for the percentage leaving the outlet, distance to listener, directivity and reverberation time.

Removal of a suspended ceiling can, therefore, cause the noise level of HVAC to increase. For a FCU, this effect can lead to around an 8NR increase to the noise level.

As well as fan coil units, the acoustic effects of other HVAC elements, normally installed behind a false ceiling, need to be considered. This can include common extracts (bell mouths), CAV/VAV and any equipment further upstream that now has a direct sound path to occupants (AHUs).

Air distribution solutions for exposed ceilings

A traditional solution offered to HVAC system designers has been the addition of an extended face

plate to diffusers adding a Coanda surface. While this will offer some improvement, air distribution may still be far more ideal.

A more effective approach is to employ the latest generation of swirl diffusers designed with exposed ceilings in mind. These swirl models are designed with a gap between the diffuser face and the plenum, which allows for the air to discharge horizontally and form a 'Coanda jet'.

The air flowing through the swirl pattern face connects to this jet, increasing the throw distance. For high rooms, models can be provided with a centre punched face for vertical air discharge.

Solutions for heating and cooling

In a room without a false ceiling the warm air is free to stratify. This means the space above the diffusers will be heated before the occupied zone, wasting energy, slowing the rate temperature change and possibly creating discomfort (due to high temperature gradients between head and ankle).

Until recently, this had remained a problem for HVAC designers, but the introduction of variable geometry diffusers in recent months has brought an effective solution. They can be designed with a thermal actuator and an internal mechanism to manage air more effectively. An adjustable internal sleeve enables the unit to move between horizontal and vertical air discharge, depending on whether the system needs to cool or warm the space.

During cooling, the air discharge is horizontal and radial. As the supply temperature increases, the discharge pattern will switch automatically to vertical, directing



RFD-V diffusers are designed with a gap between the diffuser face and the plenum which allows for the air to discharge horizontally.

warmer air more effectively into the occupied space. Once the supply temperature decreases, the air discharge switches back to horizontal once more. These changes to air discharge are controlled by an integral thermal actuator within the diffuser which, in turn, controls the internal sleeve. The supply air to room air temperature difference may range from -10 to +15K. By facilitating the ability to move automatically between cooling and heating, a variable geometry diffuser enables the comfort conditions for the occupied space to be managed much more effectively.

Until recently, bringing the aesthetic impact of exposed ceilings to a building's interior involved the creation of air movement challenges for those designing ventilation, cooling and heating systems. With the latest generation of air terminal devices, the architect's interior design intentions can be achieved without compromising the comfort conditions for building occupants.

 More information is available at www.troxuk.co.uk



The absence of a ceiling surface creates inevitable challenges in relation to air movement and acoustics.

A recent survey by the British Property Federation found that 70% of commercial buildings in the UK had evidence of mould growth.



The **silent** intruder



Nicola Rivers, Indoor Climate Specialist at Zehnder Group UK, discusses the importance of understanding the impact of condensation in commercial buildings.

With colder nights drawing in and the heating being ramped up, we start to spend more time indoors and enter hibernation mode, be it at work or home.

We seek out cosy spots, put the kettle on hundreds of times and close doors and windows but in our bid to stay warm we overlook the harm our human behaviours have on the buildings in which we reside.

I'm talking of course about condensation; the often-overlooked adversary in buildings, commercial and residential, that silently creeps into spaces, leaving behind a trail of consequences that can significantly impact the structural integrity,

occupant health, and overall efficiency of a facility.

Despite its seemingly innocuous nature, condensation is a pervasive issue that demands attention and proactive measures within the realm of commercial building management.

No building is immune. Warehouses, schools, restaurants, offices, hotels and even hospitals can fall victim. Older buildings that are not insulated are most at risk but newer buildings with inadequate airflow can also be vulnerable as we seek to better insulate for net zero gains.

Condensation occurs when warm, moisture-laden air comes into contact with a cold surface, causing the water vapor to transform into liquid water. It is especially prevalent in commercial buildings because of temperature differentials between indoor and outdoor environments, as well as variations within the building itself. Without effective ventilation within the building, the airflow is restricted and humidity build-up exacerbates the problem.

Condensation on its own shouldn't be cause for alarm despite being an irritant and leading to financial implications. However, where condensation forms on roofs and walls in colder conditions, the drips can lead to damage of internal finishes, machinery or materials as well as add to health and safety dangers within the workplace. What is more alarming is that, if left alone, condensation can lead to damp and turn into black mould which is toxic to occupants.

A recent survey by the British Property Federation found that 70% of commercial buildings in the UK had evidence of mould growth while similar studies by the Health and Safety Executive found that 40% of workers in the UK had been exposed to mould in their workplace. In its 2021 study, researchers found that exposure to mould in commercial buildings was associated with an increased risk of hypersensitivity pneumonitis, a serious lung disease.

Mould can cause a number of health problems for anyone

who spends time in the building, including employees, customers, and visitors. This can range from a blocked nose and sore throat to itchy skin and in winter these symptoms are often mistaken for those of the common cold.

In extreme cases mould can cause severe health issues and even death. For example, a 2022 study by the University of Birmingham found that exposure to mould in commercial buildings was associated with an increased risk of asthma attacks, especially in children.

Building damage and poor indoor air quality

One of the primary concerns associated with condensation in commercial buildings is its potential to compromise structural integrity. Moisture accumulation can lead to the decay of building materials, promoting the growth of mould and mildew. Over time, this can weaken the structural components, resulting in expensive repairs and jeopardising the safety of the building.



Condensation can lead to damp and turn into black mould which is toxic to occupants.

Furthermore, condensation on metal surfaces can initiate corrosion, accelerating the deterioration of essential structural elements. This is particularly problematic in buildings with extensive metal infrastructure, such as warehouses and manufacturing facilities. Regular inspections and maintenance are crucial to identifying and addressing these issues before they escalate.

Condensation not only affects the building's physical structure but also has a direct impact on indoor air quality. We know that the average family produces 24 pints of water vapour a day through routine activity – just think how much more that becomes in a working environment. The times the kettle is boiled in an office, cooking from commercial kitchens and canteens, even showers at the gym.

The damp environments created by condensation provide an ideal breeding ground for mould and mildew, releasing spores into the air. Inhalation of these airborne contaminants can lead to respiratory issues, allergies, and other health concerns among building occupants and without effective means to ventilate the building and reduce the humidity in the air, the problem grows or keeps returning.

It isn't just health and structural concerns that we need to consider, however. Condensation-induced moisture can also compromise the effectiveness of insulation materials, reducing their thermal resistance and contributing to uncomfortable indoor temperatures.

This constant battle between warm indoor air and cold

exterior surfaces necessitates increased heating or cooling efforts to maintain a comfortable temperature within the building. It is this heightened demand for energy that not only strains HVAC systems but also translates into higher operational costs for the commercial property.

Mitigating the impact

Addressing condensation in commercial buildings requires a multi-faceted approach. Investing in proper insulation and effective ventilation systems can help regulate indoor humidity levels, minimising the conditions conducive to condensation. Routine inspections and maintenance are essential to identify and

rectify potential issues before they escalate, safeguarding the structural integrity of the building.

In some cases, a building will have a ventilation system that should work for the building it serves, yet condensation problems still arise. This could mean that the system was installed incorrectly and needs to be reviewed or checked. No commercial ventilation system, installed and performing correctly by a competent M&E contractor, should have humidity build up to that degree.

Alternatively, if a building is a multi-purpose space or has seen alterations in its layout, be it through expansion or refurbishment, this complexity is further compounded. What may once have constituted an effective

method of air circulation during the initial construction may no longer prove suitable. For example, when an internal structure of an office is modified owing to a change of use or increase in personnel.

Adjusting the ventilation system to address these modifications isn't always a feasible option and, in these cases, systems will need renewed consultation to assess the requirement and maintenance going forward.

A ventilation system must also be serviced properly to ensure it functions as intended. Regular maintenance of these systems is crucial - such as changing filters annually and ensuring extract fans are in operation.

Though often overshadowed by more overt building issues, condensation poses a substantial threat to the structural integrity, occupant health, and operational efficiency of commercial buildings. Acknowledging its presence and implementing proactive measures are paramount to mitigating its impact.

Where sustainability and energy efficiency are at the forefront of building management concerns, addressing condensation is not just a matter of maintenance. It's a strategic investment in the longevity and performance of commercial structures and people's health.



Mould can cause a number of health problems for anyone who spends time in the building.



Government recognition for **Smart Optimisation** project

Energy efficiency project in Central Dublin successfully uses new methodology to meet new challenges and targets.

A high-tech energy-saving project at a prominent Dublin office building has helped bring about a 76% reduction in energy demand and been officially recognised by the Irish Government.

The project, which was carried out by Symphony Energy on behalf of Hibernia REG has earned a commendation from the Irish government and involved a digital retrofit to further reduce energy waste in what was already considered a highly-efficient building (LEED Platinum rated).

The building, 1 Cumberland Place, serves as the European HQ for social media giant X (formerly Twitter). It achieved LEED Platinum status in 2018 when the building underwent total refurbishment and the latest challenge was to deliver radical reductions in both gas and HVAC electricity demand without compromising on comfort levels.

Recently acquired by Brookfield Asset Management, Hibernia REG is a major Irish property group with a €1.5 billion portfolio primarily comprising high-quality offices in central Dublin.

It entered a five-month engagement initially with Symphony's Smart Optimisation programme. This was followed by a 12-month Measurement and Verification (M&V) process. It

resulted in HVAC electricity savings of 75%, gas savings of 76%, as well as a significant drop in Base Building Energy Use Intensity (EUI) from 121 to 44.

Mapping and Learning

Hibernia REG partnered with Symphony Energy in 2022 to identify energy inefficiencies and create saving opportunities in the 11,984 sq.m office building.

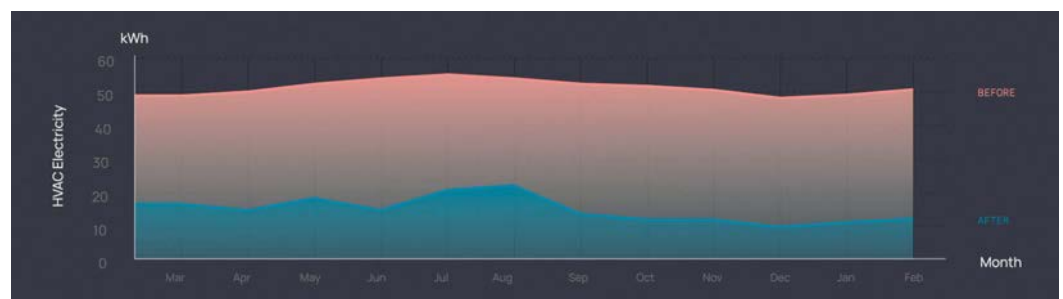
Hibernia REG's Director of Sustainability, Neil Menzies, said: "As an industry, we need to look

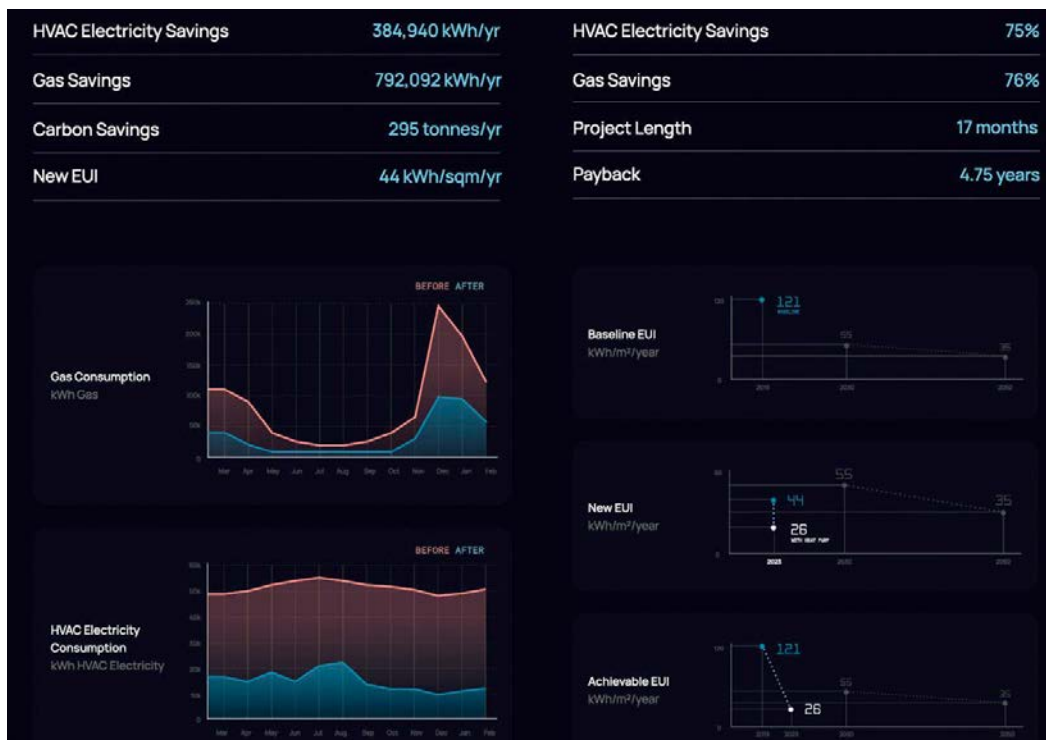
beyond BERs and construction-only green building certifications to focus on in-use building performance. Having achieved LEED Platinum at 1CP in 2018, one of the first to be certified in Ireland, our recent partnership with Symphony has since helped us achieve incredible levels of energy efficiency."

The project began with an extensive review of the building physics, HVAC design and installation, along with monitoring various BMS (Building Management System), weather

forecasting and IoT data points via a Loytec LINX automation server.

In order to add even more data to the picture, 119 Welltech smart sensor controllers were introduced to monitor the IEQ (Indoor Environmental Quality) of individual spaces throughout the building. These were newly designed by Symphony's in-house team and it was the first time they'd been used as part of a project toolkit. They allow monitoring of up to 10 key metrics including CO2, occupancy and temperature.





In addition to providing real-time insights into ventilation requirements, the technology can control the local plant tasked to deliver the specified air quality while exchanging key data with the building management system (BMS).

The mapping and learning exercise revealed the environmental signature of the building from which a virtual model could be created in a building energy management platform, capturing key aspects of its energy dynamics and performance.

Custom performance algorithms were used within a controlled sandbox environment to conduct simulations, evaluating the response of the building's energy systems under various demands and conditions.

This process allowed different strategies, configurations and scenarios to be tested, providing valuable insights into the performance of the building. Targeted opportunities for optimisation that would enhance the building's energy performance were identified.

Optimisation

The next step was to align the virtual model of 1 Cumberland Place with the real building so that the optimised operational settings could be introduced.

With the Loytec LINX automation server acting as an additional brain for the BMS, the new settings were deployed from Symphony Cloud and began to run in place of the prior function of the BMS.

The alignment process allowed seamless transformation of the HVAC energy performance of the building and immediately reduced its energy usage. Custom algorithms now continuously predict, monitor, and respond to real-time fluctuations in energy demand while delivering newly-optimised HVAC performance.

The sensor-controller is now focusing ventilation control by operating at a highly-localised level, effectively managing the airflow within the building as a collection of micro-environments. Fresh air supply precisely follows the demand as occupants transition from one area to another. As a result, the AHU (Air Handling Unit) plant can reduce its output, optimising energy consumption.

Even with reduced airflow in some areas, the sensor control is delivering more than the originally-designed quantity of air to spaces that require it so each individual area of 1 Cumberland Place receives superior Indoor Environmental Quality (IEQ) levels.

Waste heat is being recycled into usable heat while generating free cooling for the building. This process transfers the heated chilled water returning from the fan coil units, into the AHU cooling coils. These coils use the cool outside air to remove heat from the warmed chilled water so this water can return to the fan coils to collect more heat from rooms with surplus heat.

By cooling the chilled water in the AHU cooling coils, the incoming fresh air is heated. This in turn has the effect of mostly eliminating the need for any heating of the air by the heating system AHU heating coils.

Automation

All the relevant BMS data, new WellTech data and externally-sourced IoT data is merged onto Symphony's cloud platform. This provides key personnel with insights into the operation of the building and intervention tools for additional control.

Custom performance algorithms apply formulas across various fields and IoT data to form virtual data points that automatically optimise the control of the HVAC plant and provide unique insights into small but high impact operational nuances.

A spokesman for Symphony said: "Our algorithms are continuously learning and adapting to both seasonal forecast data and changing conditions within the building, allowing for automated, dynamic and responsive energy management at 1 Cumberland Place."

The cloud platform can be merged with energy metering and

other data sources. By hosting the BMS and associated virtual data, it can report key metrics to its own and other ESG reporting tools.

Hibernia REG's Head of Facilities Management, Brian Fitzpatrick, said the project had 'revolutionised' its facilities management.

"We are delighted with the outcomes achieved at 1 Cumberland Place," he said, adding: "The solutions have not only streamlined our operations but are playing a pivotal role in our sustainability journey."

The results

The total building gas consumption was reduced by 69%. The HVAC portion was reduced to the order of 76% when the hot water services and cooking gas were factored out.

The domestic hot water is generated by an independent system that was not part of the Symphony project.

The total landlord electricity consumption was reduced by 63%. The HVAC portion was reduced to the order of 75%.

For 87% of the 2,946 cooling hours post implementation, Symphony Cycle supported the full cooling load of the building for free and the company estimates that this alone is responsible for 30% of the total energy savings.

The central HVAC energy intensity during the 12-month savings and verification was 44 kWh/sqm/yr. This represents an unprecedented energy performance for a gas-heated, air-conditioned office building in Ireland.

The UKGBC Net Zero Carbon Buildings Framework sets out the Paris Proof EUI (Energy Use Intensity) targets for the Net Lettable Area (NLA) of commercial office spaces. With the successful completion of this project, 1 Cumberland Place has now exceeded its 2030 Paris Proof Interim EUI Target energy consumption of 55 kWh/sqm/yr.

By replacing the current boiler system with an energy-efficient heat pump, the building is set to achieve its 2050 Paris Proof EUI Target of 30 kWh/sqm/yr with an achievable EUI of 26 kWh/sqm/yr.

"Having achieved LEED Platinum at 1CP in 2018, one of the first to be certified in Ireland, our recent partnership with Symphony has since helped us achieve incredible levels of energy efficiency."



The evolution of **commissioning**



CSA Vice Chair, **Keith Barker**, takes a look at the sector's evolution and progression over the past 30 years.

and providing a clear path of development, they remained fiercely competitive.

Then and now

In those early days it was obviously a struggle to generate enough income to be able to afford the development costs for the training material required. The initial companies kept putting their hands in their pockets to keep things progressing. Many engineers shared their time and technical knowledge for free to create the first Commissioning Engineers Compendium. Selling those and fluorocarbon fluid for manometers started to bring in funds that were devoted to producing training material.

The problem for the CSA was that there was no simple way to deliver that training. With trainees spread among dozens of companies and distributed across hundreds of building sites, class-based training was practically impossible. Remember that this was back in the early 1990s, when electronic communications were still very much in their infancy.

The only sensible solution was to adopt the 'Distance Learning' model. The series of three courses,

DLC-A, B and C, were constructed to take trainees through from a new starter to someone that could test and regulate a ventilation or heating cooling system and demonstrate its performance.

Each of these consisted of a dozen or so modules of study. Again, senior engineers and company principals gave their time to act as tutors for those working their way through these modules. The transmission of the material was via a combination of the postal service, telephone,

facsimile (remember those?) and the early stages of e-mail.

The next step was developed to identify the more accomplished commissioning engineers who could problem solve a system when normal proportional balancing procedures could not produce the correct result. This involved elements of design review and identifying issues with the installation. To achieve this standard, further study of the technical aspects of systems and training on

The recent CSA Awards evening brought home just how much progress the commissioning industry

has made in the past three decades.

The CSA came about because the leading companies in the field realised that they needed a framework within which prospective commissioning engineers could be trained and developed. It was obvious to them that no one company would have the resources to complete such a mammoth task alone.

Their foresight and willingness to work together for the benefit of all must be applauded. They didn't entirely put their individual company aspirations aside. Outside of the CSA's aims of getting commissioning recognised as a legitimate function within the construction industry

Originally the CSA squatted in Commtech's offices in Coulsdon, Surrey



case studies to demonstrate the relevant abilities was required.

The wherewithal to maintain this progression was now generated by membership fees from the growing number of commissioning companies that joined and those far-sighted commissioning people who recognised the value of what the CSA was doing so joined as individual members.

Formation of technical committee

Spreading its wings, the CSA also created a technical committee that began preparing and publishing guidance notes and technical memoranda. It also began publishing its index newsletter to keep members informed.

This required an administrative framework. It was recognised very early on that a secretary was needed. Initially a part-time role, it soon became a full-time requirement.

Accommodation remained a key problem. Originally the CSA squatted in Commtech's offices in Coudon, Surrey. It then progressed to co-habiting in the home of whoever was the current secretary before occupying rented office accommodation in and around Horsham.

Working partnerships

The CSA now has its own office premises, a branch in the Middle East, nearly a hundred corporate member commissioning companies, just under 1,000 individual member commissioning engineers and dozens of associate member companies that are connected with commissioning in one way or another. Those members are spread across more than 70 different countries from the Americas to the Antipodes.

The CSA works with other organisations such as CIBSE and BSRIA to provide commissioning expertise in many of their technical documents. It also runs training for commissioning managers with its renowned Introduction to Commissioning Management (ITCM) course and the accompanying accreditation system.

This past year has also seen some significant events. Firstly, the CSA has worked with BESA to get its training schemes and career development path accepted as an NVQ equivalent so that commissioning engineers with CSA accreditation are now recognised as a category for CSCS cards in their own right.



Secondly, the CSA has employed a technical manager alongside the existing office staff so that the efforts of the training and technical committees can be coordinated and aimed at dovetailing all of their efforts into both regular updates for the training and technical guidance material and developing it even further.

The next step

So, what's next? The involvement with BESA has proved to be beneficial to both sides. They have been developing an on-line training and examination platform that is ideally suited to the CSA's DLC courses and examinations and it is expected that these will be used for early trials of the platform.

That will allow BESA to test and refine the system and take it live for all of its own training operations as well as giving the CSA a future-proof vehicle. It will take away the difficulties that surround getting people to the Horsham office or finding venues and invigilators for remote operations.

The next item being looked at is the commissioning management field. The ITCM course has always been seen as the first step and the progression to an Advanced Commissioning Management course has already been agreed and the resources allocated. It is hoped that this will come about in the next few months.

The CSA's work with CIBSE and BSRIA will continue and there are already plans for further technical input to their commissioning documents. Those organisations also work with government departments concerned with buildings, construction and the environment and the CSA has been approached regarding assisting them with information and material for those activities.

The CSA has looked at how it can assist with developments in other aligned fields. The water treatment industry has encountered the same issue with CSCS cards that the commissioning world encountered, and it has been causing no little angst for the companies involved.

As a number of the CSA's member commissioning companies have a water treatment division, the CSA offered to use its expertise in training material development and its familiarity with BESA's requirements to develop an equivalent training syllabus and accreditation system. This is now under way, and it is hoped to have something in place sometime in 2024, before the expiry of the current CSCS card arrangement on 31 December, 2024.

In just over 30 years, the CSA has gone from around a dozen forward-thinking company principals to an international organisation that must be regarded as one of, if not the most, recognised authorities on building services commissioning.



What is even more remarkable is that, until recently, it has been done pretty much through the efforts of unpaid volunteers.

It also has to be remembered that much of what the CSA does depends on people knowing what is going on. Thanks to continued support from organisations like MBS Magazine and others, the CSA's message is out there and long may it continue.

 More information is available at www.csa.org.uk



Largest **VO rollout** in UK history

Pub chain cuts carbon at more than 1,100 sites in unprecedented project.

A voltage optimisation programme, which is one of the largest of its kind in the UK to date, has enabled one of the largest operators of restaurants, pubs and bars in the UK to significantly cut its costs and improve its carbon footprint nationwide.

VO specialist Powerdown220 carried out the work for Mitchells & Butlers, whose headquarters are in Birmingham, and whose brands include All Bar One, O'Neills, Harvester, Toby Carvery and many more. Voltage optimisers were installed at more than 1,100 sites across the country.

Mitchells & Butlers is one of the largest operators of restaurants, pubs and bars in the UK, providing a wide choice of eating and drinking out experiences and has a vast estate with more than 1,600 sites.

Voltage optimisation is one technology Mitchell & Butlers had previously considered, to cut both costs and carbon. In the UK, average voltage is 242v but CE marked equipment is designed to operate at 220v. Often without realising it, UK businesses are paying higher bills for excess voltage, which is also contributing to premature equipment failure.

Voltage optimisation is a transformer-based technology that lowers the voltage supplied from the National Grid to match the needs of a site and its equipment. Mitchells & Butlers had previously

experimented with the technology on a smaller scale, but by 2021 a range of factors, in particular the energy crisis, had made the case for VO increasingly compelling. VO had the double benefit of cutting both costs and carbon.

Energy Manager at Mitchells & Butlers, Dale Fenton, said: "I didn't realise beforehand that this would be the biggest project of its kind in the UK, but that fact puts it all into perspective."

The project had to be delivered with minimal disruption to operations and, although a formal timeframe was not established, Mitchells & Butlers wanted as many machines installed in as short a time as possible.

It was a tough challenge to provide the resources or expertise necessary to carry out a rollout on this scale in less than a year, still less put together a convincing plan to demonstrate feasibility, Dale said, adding that Powerdown had a "really robust plan".

From survey to installation

The first step in the project was a survey of each individual site across the UK, to identify which ones required optimisers. On-site inspections were also necessary to identify potential problems, challenges or opportunities and develop a bespoke installation plan for each individual site. This was especially important as in addition to the size of the estate, there were huge variations in building type.

The survey itself was a colossal undertaking, but the process helped rule out sites where installation was not feasible from a practical or logistics point of view, or where the voltage supply was already lower than average. Following the survey, approximately 1,125 sites were identified as suitable beneficiaries for VO. Combined with a small trial of VO that was funded by Powerdown220, the survey gave Mitchells & Butlers the confidence to proceed.

When the survey was complete, work began in September 2022. Powerdown220 had designed each installation plan to try and ensure a uniform process across the vast estate.

Project manager, Powerdown220's Director James Goodby, said: "Ideally, you wanted to try and make sure someone in Plymouth was getting the exact process as someone in Newcastle."

Beginning with just five machines per week, at the height of the rollout 60 machines were being installed every week. Powerdown220 worked close with its own preferred installer, Ashcrofts, to carry out the installations, which were often carried out at night or early mornings.

The project was close to its final stages at the time of MBS going to press.

Unique challenges

Owing to the unprecedented scale of this project, challenges

were inevitable. One potential challenge both sides were aware of heading into the project was the scale of resources that would be demanded, particularly in terms of materials. Vast quantities of steel and copper had to be ringfenced because of the cabling required.

The extra capacity required to manufacture new optimisers on this scale also needed forward planning. GWE, the Sheffield-based manufacturer who pioneered the introduction of voltage optimisers for the UK market, provided a 15-person team who were solely dedicated to this project for several months.

A large number of trained and available technicians also helped to carry out the installations.

Effective communication between Powerdown220 and Mitchells & Butlers was also essential to ensuring that when issues did arise, they could be resolved quickly, and processes put in place to prevent recurrences.

"We may as well have lived together at the peak of the project," said Dale. "Where did have issues, we were able to jump on it very quickly."

James Goodby added: "We are enormously proud to have completed a project of this scale and delighted that M&Bs placed their trust in us. The experience of successfully completing this rollout in such a short period of time has also provided unique opportunities for learning, which we can now carry forward."

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New information hub features case studies and white papers

Ideal Heating Commercial Products has introduced a new net zero information hub on its website - idealcommercialboilers.com/net-zero. The hub is home to case studies, white papers, and instructive guides.

A full array of Ideal Heating low carbon commercial heating technologies is covered, from heat pumps through to heat networks and hydrogen blend-ready boilers.

The 'Heat Pumps - Road to Decarbonisation' White Paper is essential reading, whilst the new 'Hydrogen Guide: Understanding the Hydrogen Discussion' is designed to educate and inform people on hydrogen in heating. It provides an overview on the use of hydrogen as a fuel for commercial boilers.

The company's range of low carbon heating solutions are also addressed. These include ECOMOD commercial heat pumps, hydrogen-ready condensing boilers, and POD Heat Interface Units (HIU).

www.idealcommercialboilers.com/net-zero



Air handling unit has integrated heat pump charged with R32 refrigerant

Nuaire has expanded its Boxed Packaged Solution (BPS) range of air handling units (AHUs) with the the BPS-ECO-HP, a unit with integrated heat pump charged with R32 refrigerant.

By using R32, the most efficient and lowest-global warming potential (GWP) refrigerant on the market for an AHU, the BPS-ECO-HP is more efficient when carrying heat and has a lower impact on the environment. Integrating the heat pump eliminates the need for on-site refrigerant installation works.

The heat pump system is installed within the thermal wheel, allowing efficient heat recovery. The incorporated dual compressor operation features an automatic defrost control strategy.

When the build-up of frost in the exhaust coil reaches a limit, the dual system will automatically respond and start warming up the second system.

www.nuaire.co.uk



Multiple lines of commercial high temperature launches from Carrier

Carrier has introduced a new line of high temperature and very high temperature heat pumps for use in industrial, commercial and public buildings and district heating.

Designed to reduce both carbon emissions and energy costs, the new line consists of AquaForce® and AquaSnap® air and water source heat pumps with varying capacities from 30 to 735 kW and water temperatures from 82 to 120 deg C with low global warming potential (GWP) hydrofluoroolefin refrigerants.

The high temperatures enable the heat pumps to replace fossil fuel boilers in heating applications such as apartment blocks and residential estates, commercial buildings, food manufacturing, industrial drying, biogas production and chemical plants.

In addition to harnessing heat from ambient air and the ground, the heat pumps capture wasted heat from a wide range of sources, including data centres, leisure facilities, hotels and restaurants, process water, flue gases and sewage systems. Heat collected can be used for comfort heating and domestic hot water production in large buildings and facilities. The heat pumps can also be applied in industrial applications and in district and local heating networks where high temperatures or very high temperatures are required.

The units come ready to connect to Abound, Carrier's cloud-based digital platform that enables real-time, intelligent outcome-based results that make buildings more efficient and responsive. To minimise operating costs, users can opt for one of Carrier's BluEdge® service options to keep heat pumps operating at peak performance and efficiency throughout their lifecycle. This leads to predictive maintenance rather than preventive maintenance, saving time and money.

"The expansion of the AquaForce and AquaSnap ranges is a crucial step in delivering our commitment to support the European Green Deal and helping decarbonise the heating segment in Europe," said Raffaele D'Alvise, Marketing and Communications Director, Europe Commercial HVAC, Carrier. "With a focus on high temperature, performance, reliability and efficiency, these heat pumps are an excellent solution for customers looking to reduce their carbon footprint and contribute to a more sustainable future by replacing or integrating with fossil fuel generators in hybrid systems."



Innovative heat pump connection solutions

Watts Industries UK's new heat pump connection solutions range offers a wide range of components designed to seamlessly integrate air-to-water heat pump systems with heating and hot water networks.

The solutions facilitate straightforward heat pump installation and are suitable for both new build and retrofit projects, aiming to maximise both energy efficiency in the system and provide building occupants with desired comfort levels.

From the specifically designed Microflex HP which enables fast installation of the heat pump away from properties to smart home systems, hydronic heating and balancing valves, customers can select the exact components to deliver a highly efficient heat pump system.

Sales Director UK of Watts Industries UK, Kerry Harris, said: "In the UK, we have seen the transformation of energy and environmental policies that are shifting the attention of consumers and suppliers to more effective and sustainable HVAC systems for both homes and commercial properties. Heat pumps have a key role to play in delivering the future of sustainable heating in the UK and we are thrilled to be launching our innovative range of heat pump solutions."

"By creating this dedicated range, we can support our customers to deliver efficient heat pump installation to their customers and, in many cases, cost savings thanks to the innovation in our Microflex pre-insulated pipe."

For more information about any of our heat pump products or for support with your heat pump project, please call us on 01480 407074 or email wattsuk@wattswater.com

www.wattsindustries.co.uk



New heat pump featuring R290 to revolutionise home heating

Samsung Electronics Air Conditioner Europe (SEACE) has launched a pioneering product, the EHS Mono R290 heat pump, in the UK.

Unveiled earlier this year at InstallerSHOW in the NEC, Birmingham, the EHS Mono R290 has a remarkably low Global Warming Potential (GWP) of 3 (compared to the GWP of other refrigerant technologies such as R32 (675)). It provides a consistent supply of high hot water temperature, reaching up to 75°C, making the range ideal for renovations and retrofits.

Moreover, the EHS Mono R290 boasts an enlarged integral plate heat exchanger capable of transferring more heat at once compared to a conventional outdoor unit, thanks to a heat transfer area of up to 39% larger. It boasts a reliable heating performance, enabling it to deliver a 100% heating performance in temperatures as low as -10°C. It also enables the production of Domestic Hot Water (DHW) at 70°C when the outdoor temperature is -10 to 43°C ambient temperature without using the booster heater, thus saving energy while producing DHW on hot summer days.

Heating Product Manager in the UK for Samsung Climate Solutions, Joe Raftery, said: "The internal

components of the unit have been adapted when compared to a standard R32 monobloc heat pump to support the separation of the R290 refrigerant and the rest of the system. Designed to work seamlessly with R290, homeowners and installers alike will appreciate the ease of operation of this unit."

The EHS Mono outdoor unit is designed for simple installation, service and maintenance. The internal components of the heat pump can be accessed through the side panel, which can be removed by simply loosening three screws. This results in significant time and effort saving during the installation, maintenance and servicing procedures.

Styled in a dark grey colour, the product is available in a range of

capacities for varying requirements – 5, 8, 12, and 16kW. All the units are single fan, but notably, the 5 and 8kW units are only 850mm in height.

The new range of heat pumps can also be connected to SmartThings Energy which is compatible with voice assistants like Bixby, Google Home and Amazon Alexa and a wide range of devices.

www.samsung.com



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